REMARKS

Favorable reconsideration of this application in view of the remarks to follow is respectfully requested. Since the present Response raises no new issues, and in any event, places the application in better condition for consideration on appeal, entry thereof is respectfully requested under the provisions of 37 C.F.R. § 1.116.

Before addressing the specific grounds of rejection raised in the outstanding Office Action, applicants have amended Claims 1, 24, 25, 26 and 27 to positively recite that the claimed processing steps provide a buried oxide that includes stoichiometric oxide uniformly distributed therein. Thus, the claimed processing steps provide a buried oxide that has thermal oxide properties since little or no non-stoichiometric oxide is present within the buried oxide. In prior art SIMOX processes, a buried oxide is provided in which the upper region of the buried oxide contains stoichiometric oxide, while a lower region of the buried oxide include non-stoichiometric oxide. The presence of non-stoichiometric oxide is undesirable since it reduces the electrical quality of the buried oxide formed. Support for the aforementioned amendment to the claims is found throughout the specification of the instant application. See, for example, Page 4, paragraph [0011].

Since the above amendment to the claims does not introduce new matter into the originally filed specification, entry thereof is respectfully requested.

In the outstanding Office Action, Claims 1-27 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Specifically, the Examiner indicated that that specification merely conjectures that that the non-stoichiometric oxide precipitate is dissolved by performing the claimed processing steps. In response thereto, and to advance prosecution of the present application, applicants have cancelled the phrase

"which dissolves non-stoichiometric SiO_x precipitates formed during steps (a) and (b)" from the claims. This amendment to the claims obviates the rejection under 35 U.S.C. § 112, first paragraph. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1-27 stand rejected under 35 U.S.C. § 103 as allegedly unpatentable over the disclosure of U.S. Patent No. 5,930,643 to Sadana et al. ("Sadana")

Applicants respectfully submit that claimed methods recited in independent Claims 1, 24, 25, 26 and 27 are patentably distinguishable over Sadana since the claims of the present application recite the optimal conditions that are necessary to achieve a buried oxide that *includes stoichiometric oxide uniformly distributed therein and has a breakdown field of greater than 5 MV/cm.* In accordance with the present claimed methods, such a buried oxide (BOX) is achieved by utilizing a process in which at least one of the following conditions is meant: (i) a first oxygen ion implantation is performed using an oxygen ion dose of about 2.5E17 cm^{-2} or less, (ii) a second oxygen ion implantation is performed at an energy that is about 5 to about 20 % less than an energy used during the first oxygen ion implantation, and/or (iii) a pre-annealing soak cycle is employed prior to an internal oxidation step.

Applicants submit that Sadana discloses wide ranges for the first and second oxygen ion implantation steps and fails to recognize the criticality of performing the oxygen ion implantations within the claimed ranges for providing a BOX that includes stoichiometric oxide uniformly distributed therein and the claimed breakdown voltage. For example, Sadana discloses that the first oxygen ion implantation can be performed using an oxygen ion dose from about $5x10^{16}$ to about $6x10^{17}$ cm^{-2}. There is no teaching or suggestion in Sadana that a BOX includes stoichiometric oxide uniformly distributed therein and having an improved breakdown

field can be obtained if the oxygen dosage of the first oxygen ion implantation is performed at an oxygen dose of 2.5E17 cm^{-2} or less.

Applicants note that the Sadana reference is discussed in great details in the instant application. See, for example, paragraphs [0006]-[0008]. Applicants observe that in the instant application, it is indicated that in Sadana the lower region of the BOX includes non-stoichiometric oxide. In the claimed invention, a BOX including stoichiometric oxide uniformly distributed therein is provided.

Likewise, Sadana does not teach or suggest that a BOX including stoichiometric oxide uniformly distributed therein and having an improved breakdown field can be obtained if the energy of the second oxygen ion implantation step was at a range that was from about 5 to about 20% below the energy of the first oxygen ion implantation. Applicants observe that in Sadana it is mentioned that the first and second implantation can be performed at the same or different energies without specifically reciting that the breakdown field of a BOX can be improved or that a BOX including stoichiometric oxide uniformly distributed therein can be obtained by employing a second oxygen ion implantation at an energy of 5 to about 20% less than the energy used in the first oxygen ion implantation step. Furthermore, in the examples of Sadana the first and second oxygen ion implantation steps are performed at the same energies.

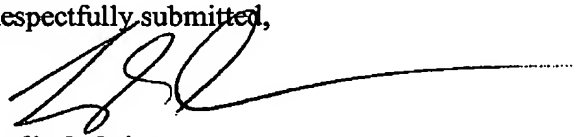
Applicants further submit that Sadana also does not teach or suggest a pre-anneal soak cycle that is capable of providing a BOX including stoichiometric oxide uniformly distributed therein. In Sadana, the soaking cycle is performed at 1000°C in 100% O_2. Applicants respectfully submit that the conditions of the prior art soaking cycle disclosed in Sadana is incapable of sufficiently providing a BOX having stoichiometric oxide uniformly distributed therein formed during previous performed oxygen ion implantation steps.

In summary, the methods of the claimed invention provide the critical conditions that are necessary to achieve a BOX including stoichiometric oxide uniformly distributed therein and having an improved breakdown field. Sadana, although disclosing wide ranges for the first oxygen ion implantation, the second oxygen ion implantation and the oxidation step, do not disclose the critical conditions that are required to obtain a stoichiometric buried oxide having the claimed breakdown field.

Based upon the above remarks, the rejection under 35 U.S.C. § 103 citing Sadana has been obviated. Reconsideration and withdrawal of the obviousness rejection are thus respectfully requested.

In view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



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